WE CLAIM:

1. A method of writing product servo sectors to a disk of a disk drive, the disk drive comprising control circuitry and a head disk assembly (HDA) comprising the disk, an actuator arm, a head connected to a distal end of the actuator arm, and a voice coil motor for rotating the actuator arm about a pivot to position the head radially over the disk, the method comprising the steps of:

(a) inserting a head positioning pin of an external spiral servo writer into the HDA, the head positioning pin for engaging the actuator arm;

(b) using the external spiral servo writer to derive a radial location of the head;

(c) actuating the head positioning pin in response to the radial location of the head in a closed loop system to rotate the actuator arm about the pivot in order to position the head radially over the disk while:

writing a plurality of reference servo sectors in a substantially circular reference path, each reference servo sector comprising a sync mark and a plurality of servo bursts; and

writing a plurality of spiral tracks, each spiral track comprising a high frequency signal interrupted at a predetermined interval by a sync mark;

(d) removing the head positioning pin from the HDA;

(e) synchronizing a servo write clock by:

using the head internal to the disk drive to read the servo bursts in the reference servo sectors to generate a position error signal used to maintain the head along the circular reference path;

using the head internal to the disk drive to read the sync marks in the reference servo sectors to generate a reference sync mark detect signal; and

synchronizing the servo write clock in response to the reference sync mark detect signal; and

(f) writing the product servo sectors to the disk to define a plurality of radially spaced, concentric data tracks by:

using the head internal to the disk drive to read the high frequency signal in the spiral tracks to generate a position error signal used to maintain the head along a substantially circular target path;

using the head internal to the disk drive to read the sync marks in the spiral tracks to generate a spiral sync mark detect signal;

maintaining synchronization of the servo write clock in response to the spiral sync mark detect signal; and

using the servo write clock and the head internal to the disk drive to write the product servo sectors along the circular target path.

2. The method as recited in claim 1, wherein each reference servo sector comprises a preamble, further comprising the steps of:

(a) synchronizing a read clock in response to the preamble; and

(b) using the read clock to read the sync marks in the reference servo sectors.

3. The method as recited in claim 1, further comprising the step of maintaining synchronization of the servo write clock in response to the high frequency signal in the spiral tracks.

4. The method as recited in claim 3, further comprising the steps of:

(a) using the head internal to the disk drive to read the high frequency signal in the spiral tracks to generate a read signal;

(b) sampling the read signal using the servo write clock to generate a sequence of sample values;

(c) generating a timing recovery measurement in response to the sample values; and

(d) maintaining synchronization of the servo write clock in response to the timing recovery measurement.

5. The method as recited in claim 3, further comprising the steps of:

(a) generating a coarse timing recovery measurement in response to the spiral sync mark detect signal;

(b) generating a fine timing recovery measurement in response to the high frequency signal in the spiral tracks; and

(c) maintaining synchronization of the servo write clock in response to the coarse timing recovery measurement and the fine timing recovery measurement.

6. The method as recited in claim 5, further comprising the steps of:

(a) clocking a modulo-N counter using the servo write clock; and

(b) generating the coarse timing recovery measurement in response to the modulo-N counter.

7. The method as recited in claim 5, further comprising the step of initializing the modulo-N counter in response to the reference sync mark detect signal.

8. The method as recited in claim 1, wherein each reference servo sector comprises a preamble, further comprising the steps of:

(a) synchronizing a read clock in response to the preamble of a reference servo sector;

(b) using the read clock to synchronously demodulate the sync mark and servo bursts in the reference servo sector; and

(c) using the servo write clock to synchronously demodulate the sync mark and the high frequency signal between the sync marks in the spiral tracks without synchronizing the servo write clock to a preamble.

9. The method as recited in claim 1, wherein the control circuitry within the disk drive is used to read the sync marks in the reference servo sectors and the spiral tracks in order to synchronize the servo write clock.

10. The method as recited in claim 1, wherein an external product servo writer is used to read the sync marks in the reference servo sectors and the spiral tracks in order to synchronize the servo write clock.

11. A disk drive comprising control circuitry and a head disk assembly (HDA) comprising a disk, an actuator arm, a head connected to a distal end of the actuator arm, and a voice coil motor for rotating the actuator arm about a pivot to position the head radially over the disk, wherein the disk comprises:

(a) a plurality of reference servo sectors in a substantially circular reference path, each reference servo sector comprising a sync mark and a plurality of servo bursts, the servo bursts for maintaining the head along the circular reference path while reading the sync marks in the reference servo sectors to generate a reference sync mark detect signal for use in synchronizing a servo write clock;

(b) a plurality of spiral tracks, each spiral track comprising a high frequency signal interrupted at a predetermined interval by a sync mark, the high frequency signal for maintaining the head along a circular target path while reading the sync marks in the spiral tracks to generate a spiral sync mark detect signal for use in maintaining synchronization of the servo write clock; and

(c) a plurality of product servo sectors written using the servo write clock, the product servo sectors defining a plurality of radially spaced, concentric data tracks.